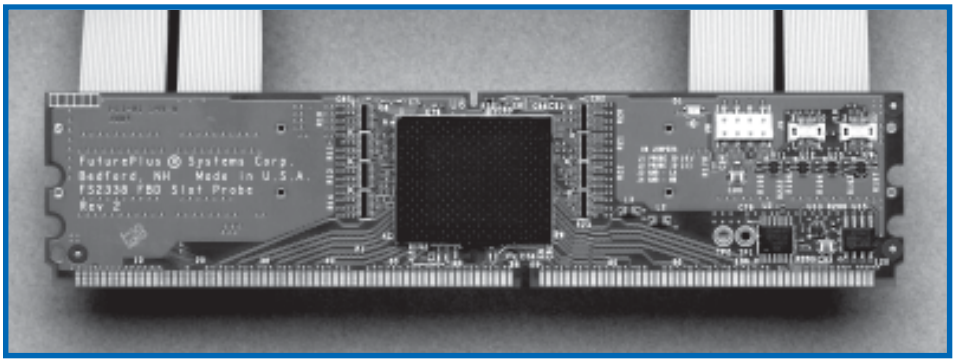
FuturePlus® Systems Corporation Fall 2004

The Bus Analyzer

RAMBUS PCI LOCAL BUS DDR MEMORY SCSI

PCI-X 266 AGP ACCELERATED GRAPHICS PORT VME64 USB UNIVERSAL SERIAL BUS HyperTransport



The FS2338 FBD slot analysis probe features a low vertical profile and minimal circuit loading.

New Probes offer Comprehensive Analysis Solution for FBD Memory Designers

FuturePlus Systems now offers three new products for the Fully Buffered DIMM (FBD) memory system designer. These versatile products enable designers to use their Agilent Technologies logic analyzer as a FBD memory bus analyzer. The FBD analysis probes, coupled with the powerful triggering and analysis capabilities of Agilent's state and timing analyzers, provide an extremely effective and efficient tool for debugging, testing and verifying products incorporating FBD memory systems.

FBD systems incorporate a combination of a serial bus and a parallel bus between the memory controller and the DRAMs. The serial bus is used for communications between the memory controller and the Advanced Memory Buffer (AMB) ASIC on the DIMM. A standard parallel bus is used from the AMB chip to the DRAMs on the DIMMs. FuturePlus developed two types of products to enable memory designers to probe activity on both the serial and the parallel bus, respectively.

Choose from two serial-bus styles

Two serial bus models probe the North and South bound communications between the memory controller and the AMB chip. Users may select one or both styles to accommodate a variety of physical and electrical constraints on their particular application.

- The FS2338 slot analysis probe has a low vertical profile and minimal circuit loading. It is the best solution for applications that do not require a fully populated memory bus.
- The FS2343 Interposer Probe can accomodate a memory device in its straddle-mount DIMM socket, allowing users to

Continued on page 2

New Low-cost PCI-X 1.0 Analysis Probe

FuturePlus Systems now offers a new passive PCI-X 1.0 Analysis Probe. The is the latest offering in the PCI and PCI-X product family. The FS2010 is designed to connect to the new Agilent 1680-, 1690- and 16900-series logic analyzer family, as well as many of the older Agilent state/timing modules.

The FS2010 operates up to 133 MHz for either 32- or 64-bit PCI-X buses. The analysis probe is completely passive, enabling simultaneous protocol decode and timing analysis.

(Continued on Page 2)

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In This Issue

- New Probes offer Comprehensive Analysis Solution for FBD Memory Designers
- New Low-cost PCI-X 1.0 Analysis Probe
- Connectorless Probing for HyperTransport
- TransView – A New Way To Display Protocol On A Logic Analyzer

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Fully Buffered DIMM Probes
(Continued from page 1)

test a fully populated memory bus. However, the extender socket increases the probe's vertical profile, and it introduces some additional circuit loading.

Both products are connected by 1-meter cables to an external logic analyzer interface board. The external logic analyzer interface board connects to the Agilent logic analyzer with standard termination adapters.

The FS2338 and FS2343 both use the Logic Analyzer Interface (LAI) function of the AMB to analyze High Speed Channel transactions at up to 4.8 Gb/s. The AMB is controlled with the probe-control software running on the Agilent 16900 logic analysis system.

Validation DIMM probes traffic between AMB chip and DRAMs

The FS2340 Validation DIMM lets you analyze AMB communications with the SDRAMs on the DIMM. The FS2340 includes a raw PC board, similar to the DIMM form factor. It is designed to allow the user to install specific DRAMs and AMBs for their particular testing purposes. The FS2340 includes straddle mount logic analyzer connectors, which minimize loading and allow probing of adjacent slots. This feature also allows probing systems with limited vertical clearance.

Embedded probing resistors minimize stub loading from the routing of the logic analysis connectors, insuring a high potential of success when using this product in your system. The FS2340 offers complete and accurate 800 MT/s state and timing analysis and provides functional integrity validation of addr/cmd and data transactions. Optional software displays the addr/cmd and data transactions in standard DDR format.

Please contact FuturePlus Systems for more details.

Related FBD Products from Agilent Technologies

Agilent Technologies now offers several related FBD tools. They are:

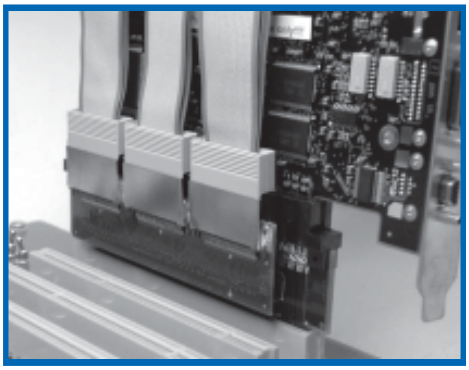
- The N4234A 4x resistor pack flying lead probe provides a convenient method to attach an Agolent 16900 Series logic analysis system to standard fully buffered DIMM resistor packs.
- The N4235A AMB parametric test fixture provides standard interfaces to an Agilent logic analyzer, oscilloscope, vector network analyzer (VNA), bit error rate tester (BERT) and pulse generator for characterizing and troubleshooting AMB's.
- The N4236A parametric test fixture provides a stan-dard interface to an Agilent oscilloscope, vector network analyzer (VNA), bit error rate tester (BERT) and pulse gen erator for characterizing and troubleshooting standalone FB-DIMMs.
- The N4237A interposer probe enables viewing of data traffic on industry standard FB-DIMMs with the Agilent 16900 Series logic analysis system.
- The N4238A slot parametric probe provides visibility into the analog characteristics of the Transmit and Receive channels from the memory controller to the AMB using an Agilent oscilloscope, vector network analyzer (VNA), bit error rate tester (BERT) or pulse generator, depending on the type of measurement needed.

Please contact Agilent Technologies for full details of these products. §

PCI-X
(Continued from Page 1)

The FS2010's interposer/extender card functionality allows single-slot operation, while also accommodating full-load testing with a PCI-X card inserted into the probe's extender socket, a straddle-mount connector located at the top edge of the analysis probe. There are no buffers between the PCI-X bus and the interposer/extender card connector. The etch length from the system connector to the interposer is about 1inch and has matched trace lengths, minimizing channel-to-channel skew.

The FS2010 can also make PCI bus measurements. For PCI protocol decode a separate software package is required. The FS1103 or FS1110 should be purchased depending on which logic analysis system is being used.



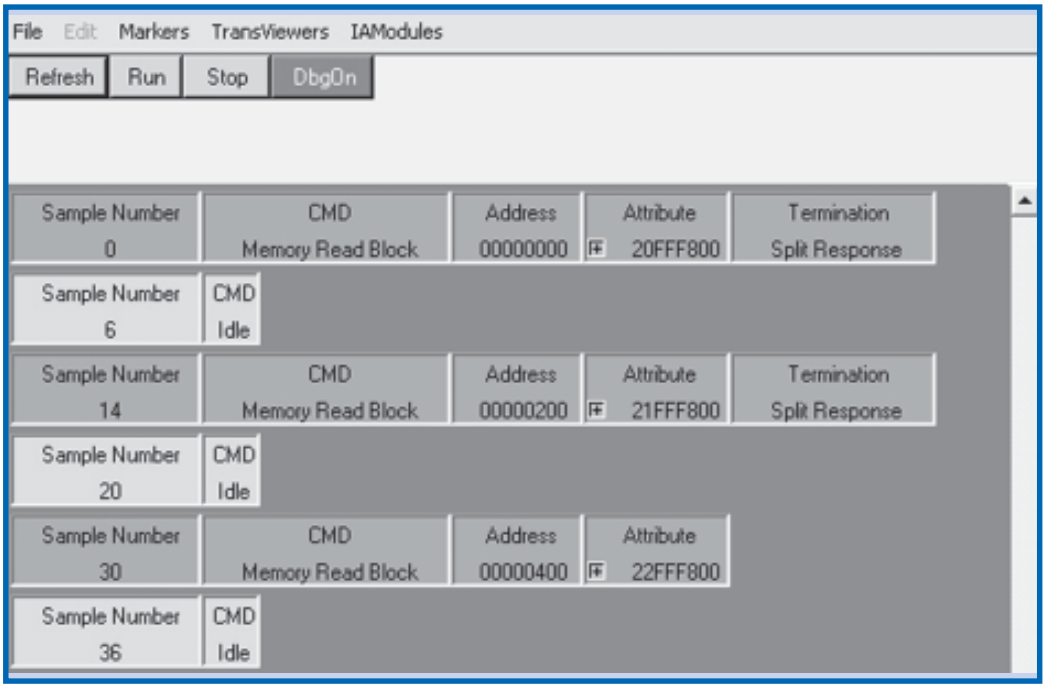
The FS2010 PCI-X analysis probe is probing a tartet system. The PCI-X card under test is inserted into the FS2010 extender socket.

The FS2010 supports Protocol Decode of PCI-X bus transactions with the Agilent 1670G, 16700, 1680, 1690 and 16900-series logic analysis systems. 32-bit PCI-X buses (four logic analyzer connectors) require two termination adapters, while 64-bit buses (six logic analyzer connectors) require three termination adapters.

To learn more about the FS2010, the wide variety of Agilent logic analyzer solutions supported and which configuration is right for your measurement needs please visit the FuturePlus web site at www.futureplus.com, or call (719) 278-3540. §

TransView™ – A New Way To Display Protocol On A Logic Analyzer

TransView, a transaction viewer is an exciting new addition to the capabilities of FuturePlus Systems protocol decode tools. This additional display function shows bus transactions at a higher level of abstraction when used with Agilent 16900 series of logic analyzers.


File Edit Markers TransViewers IAModules
Refresh Run Stop DbgOn
Sample Number 0 | CMD Memory Read Block | Address 00000000 | Attribute 20FFF800 | Termination Split Response
Sample Number 6 | CMD Idle
Sample Number 14 | CMD Memory Read Block | Address 00000200 | Attribute 21FFF800 | Termination Split Response
Sample Number 20 | CMD Idle
Sample Number 30 | CMD Memory Read Block | Address 00000400 | Attribute 22FFF800
Sample Number 36 | CMD Idle

FuturePlus TransView Transaction Viewer

The Transaction Viewer as shown in Figure 1 is displaying on a single line (sample 0) 96 ns of data capture. A traditional logic analyzer display requires 12 separate lines of state information to display the same information.

A quick glance at the decode transaction in Sample Number 0 shows that the Command is a Memory Read block, the value of the Address, the value of the Attribute phase is 20FFF800 and that the Termination is a split response

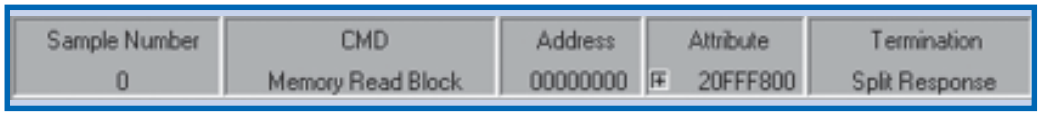


Figure 1

To view the details regarding the PCI-X Attribute a new line of information can be quickly seen by clicking on the + symbol in the Attribute box. In Figure 2 we see the display with the details of the Attribute expanded on a second line. To display the values of the Attribute phase a typical logic analyzer display would require 6 lines to display this same information.

Figure 2

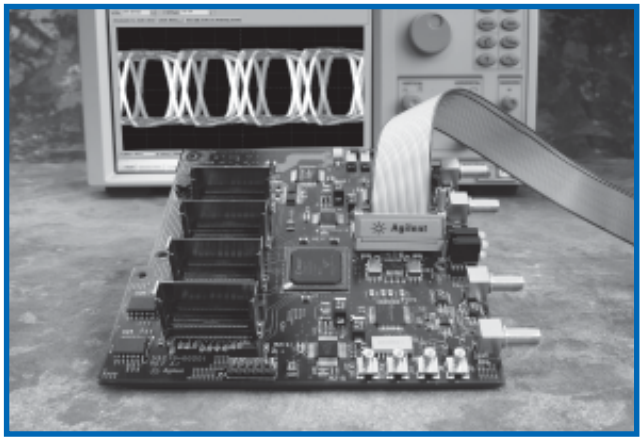
The first bus to include the TransView is PCI-X 2.0 Mode 1. FuturePlus is currently looking for a select group of users who would be willing to Beta test this exciting new capability. If you are currently using the FuturePlus FS2009 PCI-X 2.0 analysis probe and an Agilent 16900 series logic analysis system and are interested in participating in this program please call (719) 278-3540. We would also like to hear from you regarding other buses that would like to see supported by this exciting new capability. §

Soft Touch Probing for HyperTransport™ Apps

FuturePlus now offers the FS2243 HyperTransport analysis probe, featuring the Agilent Soft Touch "connectorless" probing technology.

A connectorless probing solution requires the designer only to place solder pads on the traces of the link. This method is easier to implement on targets with low layer counts and tight space requirements.

For 8-bit links, one connector attaches to the TX path, while another connector carries the RX path. For a 16-bit link both connectors are used.



Achieve quick, easy, and repeatable signal access, without designing in a connector.

Agilent soft touch probes provide an accurate, reliable connectorless attachment to your device.

This probing method also can be implemented using standard PCB pad features. Therefore, it can be designed into a target board at no additional cost. Connectorless probing requires no tip resistors on the target. Soft Touch probing is capable of operating with a 1.2 GHz clock (2.4 GT/s data rate).

To measure both directions of 16-bit links requires two FS2243 analysis probes.

The connectorless probe requires a retention module to provide its mechanical support on the target board. The module is simply attached to the board by soldering its legs to the plated through-holes that are part of the footprint described above. The FS2243 is then connected to the target by placing the probe head into the retention clip, taking care to maintain polarity, and screwing down the captive fasteners.

The smaller connectors, simplified routing, and the ability to place the connectors on top and on the bottom of the printed circuit board provides a maximum flexibility for probe placement.

Layout guidelines are available on the FuturePlus website at *http://www.futureplus.com/download/appnotes/fs2240an.PDF* §

The FS2243 HyperTransport Analysis Probe provides a mechanical connection, electrical interface and deserializiation of the data from a HyperTransport link to an Agilent logic analyzer.

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Tips and Tricks

When loading our configuration files onto a 1680- 1690- or 16900-series machine, and an information box pops up reading "The probe definition in this configuration file needs to be updated to be compatible with the general purpose probe feature", this message can be ignored, just click ok and continue. The configuration file will work just fine.

This information box appears because the *Define Probes* feature was replaced by a much better feature called the *General Purpose Probe* feature. The new feature will be incorporated in new configuration files by the end of this year. It will show the user which analyzer pod attaches to each connector on our probe. It will also show the signal name and pin connector number. The user will be able to access the *General Purpose Probe* feature through the *Overview* page of the analyzer. Using the *General Purpose Probe* feature, no matter what slot the cards are in, the pods will automatically be re-mapped and shown correctly according to the slots in which the analyzer cards are installed. §

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